

CEMP-ET

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, D.C. 20314-1000

ETL 1110-3-435

Engineer Technical
Letter 1110-3-435

1 May 1992

Engineering and Design
DRAINAGE LAYERS FOR PAVEMENTS

1. Purpose. This letter updates guidance for design and construction of subsurface drainage features for Army and Air Force pavements. The guidance supersedes that portion of the guidance provided in TM 5-820-2/AFM 88-5, Chapter 2 for design of subsurface drainage layers in pavements (Chapter 6) and provides guidance for all pavements located in both frost and nonfrost areas. The use of the guidance for flexible pavement roads, streets, or parking areas having a structural thickness less than 8 in. is optional.

2. Applicability. This letter is applicable to all HQUSACE elements, major subordinate commands, districts, laboratories and field operating activities (FOA) having Army and Air Force military construction design responsibility.

3. References.

a. TM 5-818-2/AFM 88-6, Chap. 4, Pavement Design for Seasonal Frost Conditions.

b. TM 5-820-2/AFM 88-5, Chap. 2, Drainage and Erosion Control: Subsurface Drainage Facilities for Airfields.

c. TM 5-822-2/AEM 88-7, Chap. 5, General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas.

d. TM 5-822-5/AFM 88-7, Chap. 3, Flexible Pavement for Roads, Streets, Walks, and Open Storage Areas.

e. TM 5-822-6/AFM 88-7, Chap. 1, Rigid Pavements for Roads, Streets, Walks, and Open Storage Areas.

f. TM 5-825-2/AFM 88-6, Chap. 2, Flexible Pavement Design for Airfields.

g. TM 5-825-3/AFM 88-6, Chap. 3, Rigid Pavements for Airfields.

4. Background. Research conducted at the US Army Engineer Waterways Experiment Station (WES), The Construction Engineering Research Laboratories (CERL), and the Cold Regions Research and

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Engineering Laboratory (CRREL) has shown that bases and subbases for military pavements constructed to meet Corps of Engineers density and gradation criteria are virtually impermeable. In a study conducted for CERL, Mr. Harry R. Cedergren concluded that most airfield pavements have poor subsurface drainage and that joint and surface sealing and repair programs are not able to keep surface water out of the structural sections. Based on extensive literature reviews and field surveys, it has been found that the permeability of a good drainage layer should be in the order of 1,000 to 10,000 ft/day. To ensure military pavements have adequate drainage, the criteria provided in the enclosed technical guidance is to be used for design and construction of subsurface drainage aspects of pavements.

5. Action to be Taken. The guidance in Enclosures 1 and 2 should be used for design and construction of the subsurface drainage layers for all Army and Air Force pavements.

FOR THE DIRECTOR OF MILITARY PROGRAMS:

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